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IN THE CLAIMS

1.   (Currently amended) A management computer connected through a second network to data storage apparatuses that are connected to computers through a first network, said management computer comprising:

a storage area information collecting module which collects respective pieces of storage area information from said data storage apparatuses connected through the second network, wherein each piece of storage area information relates to storage areas provided by a data storage apparatus concerned;

a hierarchy information collecting module which collects respective pieces of hierarchy information from said data storage apparatuses connected through said second network, wherein each piece of hierarchy information indicates a data storage apparatus hierarchy of a multistage connection of said data storage apparatuses, including those data storage apparatuses that have storage areas for storing data used by said computers through a storage area of a higher one of said data storage apparatuses according to said hierarchy among data storage apparatuses held by a data storage apparatus concerned; and

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a management relation information creation module which sets said ~~hierarchy~~ <u>hierarchies</u> among said data storage apparatuses to create management relation information, based on said pieces of storage area information and said pieces of hierarchy information collected in said storage area information collecting module and said hierarchy information collecting module.

2.   (Original)   A management computer according to Claim 1, wherein:

said management computer further comprises:

a management information creation module that recognizes a number of data storage apparatuses according to a number of said pieces of storage area information collected in said storage area information collecting module and prepares pieces of management information used respectively for managing said data storage apparatuses, wherein a number of said pieces is equal to a recognized number of data storage apparatuses; and

said management relation information creation module associates each of said data storage apparatuses with a piece of management information used for managing the data storage apparatus in question, and adds information

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indicating the association to said management relation

information.

    3.   (Original) A management computer according to
Claim 1, further comprising:

    a screen data creation module which creates hierarchy
display screen data that is used for displaying said data
storage apparatuses on a screen according to the hierarchy
set in said management relation information creation module;
and

    a screen data sending module which sends said hierarchy
display screen data created in said screen data creation
module to an output device connected to the management
computer itself.

    4.   (Original) A management computer according to
Claim 3, wherein:

    said screen data creation module creates pieces of data
storage apparatus display data for respectively specifying
said data storage apparatuses in said hierarchy display
screen data, and adds pieces of information identifying
those pieces of data storage apparatus display data to said

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management relation information to hold those pieces of

information in said management relation information.

    5.   (Currently amended) A management computer

according to Claim 4, further comprising:

    a management module choosing module that refers to said

management relation information to extract a piece of

management information corresponding to a certain piece of

data storage apparatus display data that is chosen when an

instruction to ~~choice~~ choose said certain piece of data

storage apparatus display data is received from said output

device, and sends the extracted piece of management

information to said output device.

    6.   (Currently amended) A management computer

according to Claim 4, further comprising:

    a warning message creation module that:

    refers to said management relation information when an

instruction to ~~choice~~ choose a certain piece of data storage

apparatus display data is received from said output device,

to extract a data storage apparatus held in said management

relation information being associated with the chosen piece

of data storage apparatus display data;

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judges whether the extracted data storage apparatus is a first type of data storage apparatus ~~(a first type data storage apparatus)~~ providing a storage area for storing data used by a computer or a second type of data storage apparatus ~~(a second type data storage apparatus)~~ providing a storage area for storing data used by a computer through said first type of data storage apparatus; and

when the extracted data storage apparatus is judged to be said second type of data storage apparatus, creates a warning message to send the created warning message to said output device.

7.   (Currently amended)   A management computer according to Claim 3, further comprising:

a notification modification module that:

refers to said management relation information to judge whether a data storage apparatus as a source of a status change notification is a first type of data storage apparatus ~~(a first type data storage apparatus)~~ providing a storage area for storing data used by a computer or a second type of data storage apparatus ~~(a second type data storage apparatus)~~ providing a storage area for storing data used by a computer through said first type data storage apparatus,

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when said status change notification is received from said

data storage apparatus connected to said management computer

through said second network; and

when said data storage apparatus is judged to be said

second type of data storage apparatus, refers to said

management relation information to create a new display

message by reflecting the hierarchy acquired from said

management relation information onto contents of the

received notification.

8-11. (Canceled).

12. (Currently amended) A computer system comprising:

a group of data storage apparatuses including at least

one first type of data storage apparatus providing a storage

area for storing data used by a computer and at least one

second type of data storage apparatus providing a storage

area for storing data used by said computer through [[a]]

the first type of data storage apparatus;

a management computer that manages said group of data

storage apparatuses;

a first network connecting between said computer and

said group of data storage apparatuses;

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a second network connecting between said group of data

storage apparatuses and said management computer;

wherein:

said management computer comprises:

a storage area information collecting module which

collects respective pieces of storage area information from

said data storage apparatuses connected through said second

network, wherein each piece of storage area information

relates to storage areas provided by a data storage

apparatus concerned;

a hierarchy information collecting module which collects

respective pieces of hierarchy information from said data

storage apparatuses connected through said second network,

wherein each piece of hierarchy information indicates <u>a data</u>

<u>storage apparatus</u> hierarchy <u>of a multistage connection of</u>

<u>said data storage apparatuses, including those data storage</u>

<u>apparatuses that have storage areas for storing data used by</u>

<u>said computers through a storage area of a higher one of</u>

<u>said data storage apparatuses according to said hierarchy</u>

~~among data storage apparatuses held by a data storage~~

~~apparatus concerned~~; and

a management relation information creation module which

sets <u>said</u> ~~hierarchy~~ <u>hierarchies</u> among said data storage

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apparatuses to create management relation information based
on said pieces of storage area information and said pieces
of hierarchy information collected in said storage area
information collecting module and said hierarchy information
collecting module.

13. (Currently amended) A ~~data storage apparatus~~
management method in a management computer connected through
a second network to data storage apparatuses that are
connected to computers through a first network, the method
comprising steps of:

collecting respective pieces of storage area information
from said data storage apparatuses connected through said
second network, wherein each piece of storage area
information relates to storage areas provided by a data
storage apparatus concerned;

collecting respective pieces of hierarchy information
from said data storage apparatuses connected through said
second network, wherein each piece of hierarchy information
indicates <u>a data storage apparatus</u> hierarchy <u>of a multistage
connection of said data storage apparatuses, including those
data storage apparatuses that have storage areas for storing
data used by said computers through a storage area of a</u>

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higher one of said data storage apparatuses according to said hierarchy ~~among data storage apparatuses held by a data storage apparatus concerned~~; and

setting said ~~hierarchy~~ hierarchies among said data storage apparatuses to create management relation information, based on said pieces of storage area information and said pieces of hierarchy information.

14.   (Currently amended)   A ~~data storage apparatus~~ management method according to Claim 13, further comprising steps of:

recognizing a number of data storage apparatuses according to a number of said pieces of the collected storage area information;

preparing pieces of management information for respectively managing data storage apparatuses, wherein a number of said pieces is equal to a recognized number of data storage apparatuses; and

associating each of said data storage apparatuses with a piece of management information used for managing the data storage apparatus in question and adding information indicating the association to said management relation

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information, in creating said management relation

information.

    15.   (Currently amended)   A ~~data storage apparatus~~

management method according to Claim 13, further comprising

steps of:

    creating hierarchy display screen data that is used for

displaying said data storage apparatuses on a screen

according to said management relation information; and

    sending said created hierarchy display screen data to an

output device connected to the management computer itself.

    16.   (Currently amended)   A ~~data storage apparatus~~

management method according to Claim 15, further comprising

of steps of:

    creating pieces of data storage apparatus display data

for respectively specifying said data storage apparatuses in

said hierarchy display screen data, when said hierarchy

display screen data is created; and

    adding pieces of information identifying those pieces of

data storage apparatus display data to said management

relation information, to hold those pieces of information in

said management relation information.

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17. (Currently amended) A ~~data storage apparatus~~ management method according to Claim 16, further comprising a step of:

referring to said management relation information to extract a piece of management information corresponding to a certain piece of data storage apparatus display data that is chosen when an instruction to choice said certain piece of data storage apparatus display data is received from said output device, and sending the extracted piece of management information to said output device.

18. (Currently amended) A ~~data storage apparatus~~ management method according to Claim 17, further comprising steps of:

referring to said management relation information when an instruction to choice a certain piece of data storage apparatus display data is received from said output device, to extract a data storage apparatus held in said management relation information being associated with the chosen piece of data storage apparatus display data;

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judging whether the extracted data storage apparatus is
a data storage apparatus (a first type data storage
apparatus) providing a storage area for storing data used by
said computer or a data storage apparatus (a second type
data storage apparatus) providing a storage area for storing
data used by said computer through said first type data
storage apparatus; and

creating a warning message to send the created warning
message to said output device, when the extracted data
storage apparatus is judged to be said second type of data
storage apparatus.

19.   (Canceled).

20. (Currently amended)   A computer system comprising:

a computer;

data storage apparatuses;

a management computer that manages said data storage
apparatuses;

a first network connecting between computers and said
data storage apparatuses;

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a second network connecting between said data storage

apparatuses and said management computer; and

a management console connected to said management

computer; wherein:

said data storage apparatuses ~~includes:~~ include one or

more first type of data storage ~~apparatuses~~ apparatus each

providing storage areas for storing data used by said

computers_[[;]] and one or more second type of data storage

~~apparatuses~~ apparatus each providing storage areas for

storing data used by said computers through a storage area

of said first type data storage apparatuses;

said management computer comprises[[:]] a storage area

information collecting module, a management information

creation module, a hierarchy information collecting module,

a management relation information creation module, a screen

data creation module, a screen data sending module, a

warning message creation module, a management module

choosing module, a notification modification module, a

modification notification sending module;

wherein said [[a]] storage area information collecting

module ~~which collects~~ issues a request to said data storage

apparatuses for respective pieces of storage area

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information from said data storage apparatuses, <u>wherein the</u>
<u>data storage apparatuses receive the request from the</u>
<u>storage area information collecting module, and send the</u>
<u>respective pieces of storage area information to the storage</u>
<u>area information collecting module in response to the</u>
<u>request, and</u> wherein each piece of storage area information
relates to storage areas provided by a data storage
apparatus concerned;

    <u>wherein said</u> [[a]] management information creation
module ~~that~~ recognizes a number of data storage apparatuses
according to a number of said pieces of storage area
information collected in said storage area information
collecting module and prepares pieces of management
information used respectively for managing said data storage
apparatuses, wherein a number of said pieces is equal to a
recognized number of data storage apparatuses;

    <u>wherein said</u> [[a]] hierarchy information collecting
module ~~which collects~~ <u>issues a request to the data storage</u>
<u>apparatuses for respective pieces of hierarchy information,</u>
<u>wherein the data storage apparatuses receive the request,</u>
<u>and in response to the request, send the</u> respective pieces
of hierarchy information ~~from said data storage apparatuses~~

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to the hierarchy information collecting module, wherein each

piece of hierarchy information indicates a data storage

apparatus hierarchy of a multistage connection of said data

storage apparatuses, including those data storage

apparatuses that have storage areas for storing data used by

said computers through a storage area of a higher one of

said data storage apparatuses according to said hierarchy

among data storage apparatuses held by a data storage

apparatus concerned;

    wherein among data storage apparatuses which are in said

multistage connection, a higher one of said data storage

apparatuses according to said hierarchy is designated as the

first type of data storage apparatus and another one of said

data storage apparatuses that is lower in said hierarchy

than said higher one is designated as the second type of

data storage apparatus, data to be stored in a second

storage area of a data storage apparatus of the second type

is a copy of data stored in a first storage area of a data

storage apparatus of the first type, and the first storage

area is a virtual storage area viewed by the host computer

as being formed in a data storage apparatus of the first

type, and the data used by the host computer viewed as being

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<u>virtually stored in the first storage area is physically</u>

<u>stored in a second storage area of the second type;</u>

<u>wherein said</u> [[a]] management relation information

creation module ~~which~~ sets <u>said</u> ~~hierarchy~~ <u>hierarchies</u> among

said data storage apparatuses to create management relation

information, based on said pieces of storage area

information, said pieces of management information and said

pieces of hierarchy information collected in said storage

area information collecting module, said management

information creation module and said hierarchy information

collecting module;

<u>wherein said</u> [[a]] screen data creation module ~~that~~:

creates hierarchy display screen data that is used for

displaying said data storage apparatuses according to the

hierarchy set in said management relation information

creation module and pieces of data storage apparatus display

data for respectively specifying said data storage

apparatuses in said hierarchy display screen data, and

adds pieces of information identifying those pieces of

data storage apparatus display data to said management

relation information;

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wherein said [[a]] screen data sending module ~~which~~

sends said hierarchy display screen data created in said

screen data creation module and said data storage apparatus

display data to said management console;

wherein said [[a]] warning message creation module ~~that~~:

refers to said management relation information when an

instruction to choice a certain piece of data storage

apparatus display data is received from said management

console, to extract a data storage apparatus held in said

management relation information being associated with the

chosen piece of data storage apparatus display data;

judges whether the extracted data storage apparatus is

[[a]] said first type of data storage apparatus or [[a]]

said second type of data storage apparatus; and

when the extracted data storage apparatus is judged to

be said second type of data storage apparatus, creates a

warning message to send the created warning message to said

management console;

wherein said [[a]] management module choosing module

~~that~~ refers to said management relation information to

extract a piece of management information corresponding to a

certain piece of data storage apparatus display data that is

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chosen when an instruction to ~~choice~~ <u>choose</u> said certain

piece of data storage apparatus display data is received

from said management console, and sends the extracted piece

of management information to said management console;

<u>wherein said</u> [[a]] notification modification module

~~that~~:

refers to said management relation information to judge

whether a data storage apparatus as a source of a status

change notification is [[a]] <u>said</u> first type <u>of</u> data storage

apparatus or [[a]] <u>said</u> second type <u>of</u> data storage

apparatus, when said status change notification is received

from said data storage apparatus ~~(i.e., said source of the~~

~~status change notification)~~; and

when said data storage apparatus is ~~judge~~ <u>judged</u> to be

said second type of data storage apparatus, refers to said

management relation information to create a new display

message by reflecting the hierarchy acquired from said

management relation information onto contents of the

received notification; and

<u>wherein said</u> [[a]] modification notification sending

module ~~which~~ sends the display message created in said

notification modification module to said management console;

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wherein said management console comprises:

a display module which displays the display data received from said management computer;

an instruction receiving module which receives an instruction from an administrator through said display module; and

an instruction sending module which sends an instruction received from the administrator through said instruction receiving module to said management computer;

said display module comprises a hierarchy display area, a warning message display area and a status change notification information display area;

said hierarchy display area displays said hierarchy display screen data and said data storage apparatus display data;

said warning message display area displays said warning message; and

said status change notification information display area displays the display message received from said modification notification sending module.

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21.   (New)   A management computer according to claim 1, wherein among data storage apparatuses which are in said multistage connection, a higher one of said data storage apparatuses according to said hierarchy is designated as a first type of data storage apparatus and another one of said data storage apparatuses that is lower in said hierarchy than said higher one is designated as a second type of data storage apparatus, and

data to be stored in a second storage area of a data storage apparatus of the second type is a copy of data stored in a first storage area of a data storage apparatus of the first type.

22.   (New)   A management computer according to claim 21, wherein among data storage apparatuses which are in said multistage connection, a higher one of said data storage apparatuses according to said hierarchy is designated as a first type of data storage apparatus and another one of said data storage apparatuses that is lower in said hierarchy than said higher one is designated as a second type of data storage apparatus, and

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a first storage area is a virtual storage area viewed by

the host computer as being formed in a data storage

apparatus of the first type, and the data used by the host

computer viewed as being virtually stored in the first

storage area is physically stored in a second storage area

of the second type.

23.   (New) A computer system according to claim 12,

wherein among data storage apparatuses which are in said

multistage connection, a higher one of said data storage

apparatuses according to said hierarchy is designated as the

first type of data storage apparatus and another one of said

data storage apparatuses that is lower in said hierarchy

than said higher one is designated as the second type of

data storage apparatus, and

data to be stored in a second storage area of a data

storage apparatus of the second type is a copy of data

stored in a first storage area of a data storage apparatus

of the first type.

24.   (New) A computer system according to claim 23,

wherein among data storage apparatuses which are in said

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multistage connection, a higher one of said data storage

apparatuses according to said hierarchy is designated as the

first type of data storage apparatus and another one of said

data storage apparatuses that is lower in said hierarchy

than said higher one is designated as the second type of

data storage apparatus, and

a first storage area is a virtual storage area viewed by

the host computer as being formed in a data storage

apparatus of the first type, and the data used by the host

computer viewed as being virtually stored in the first

storage area is physically stored in a second storage area

of the second type.

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